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PATENT SPECIFICATION
NO DRAWINGS

1,060,447

1,060,447

Date of Application and filing Complete Specification: May 1, 1964.
No. 18122/64.
Application made in Switzerland (No. 6049) on May 14, 1963.
Complete Specification Published: March 1, 1967.

Index at acceptance:—A2 D(2G1, 2G2, 2L, 3B); A5 B(1G, 1M, 31); A5 E(1A3A1, 1A3A2, 1A3A4, 1A10)
Int. Cl.:—A 23 l 3/34//A 61 k, 1

COMPLETE SPECIFICATION

Compositions for the Preservation of Foodstuffs, for the Sterilization and Hygiene of Air in Confined Spaces and for Cosmetic and Pharmaceutical Purposes

ERRATA

SPECIFICATION No. 1,060,447

Page 1, line 12, *for* "purpose." *read* "purposes."
Page 2, line 2, *for* "lown." *read* "down."
Page 3, line 10, *for* "for" *read* "with"

THE PATENT OFFICE
5th April 1967

have also been made to employ the thymol contained in *Oleum Thymi* for the preservation of fresh goods, soya sauce and other foodstuffs, and as an antioxidant for bacon (see T. Bito, Bull. Nagoya Inst. Technol. (Anniversary Issue) *4*, 218 (1952), F. Fujikawa & A. Tokuoka, J. Pharm. Soc. Japan *71*, 129 (1951), H. Schmidt-Hebbel and G. R. Martini, Anales quim. farm. *1944*, 1—3). It is further known that certain organic carboxylic acids, in particular formic acid, acetic acid and benzoic acid, have a strong bacteriostatic or bactericidal effect, respectively, and therefore a preservative action. The lower aliphatic alcohols, e.g. ethanol in suitable concentration, have the same favourable properties.

[P]

In addition to the components (a), (b) and (c), a solution promoter may also be incorporated in the compositions of the present invention in order to increase or bring about their solubility in water. Particularly suitable for this purpose are, for example, polyoxyethylene derivatives of fatty acids, and polyoxyethylene derivatives of fatty acid esters of anhydrosorbitols such as polyoxyethylene oleate or polyoxyethylene stearate and polyoxyethylene sorbitan monopalmitate, polyoxyethylene sorbitan mono-oleate, polyoxyethylene sorbitan mono-stearate, polyoxyethylene sorbitan tri-oleate and polyoxyethylene sorbitan tri-stearate.

It was also surprisingly found that with the use of solvents, the intensive smell of

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COMPLETE SPECIFICATION

Compositions for the Preservation of Foodstuffs, for the Sterilization and Hygiene of Air in Confined Spaces and for Cosmetic and Pharmaceutical Purposes

We, MAPLE LEAF TRUST, reg., a corporation of the Principality of Liechtenstein, of Vaduz, Liechtenstein, do hereby declare the the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to compositions for the preservation of foodstuffs, for the sterilization of air in confined spaces, as well as for cosmetic and pharmaceutical purpose.

As is well known, certain ethereal oils possess bacteriostatic and bactericidal properties. For example, it has been suggested to use the vapours of thymol for inhalation (Grubb, J. Am. Pharm. Assoc. *48*, 272 (1959)). The application of ethereal oils for room disinfection has also been scientifically examined (cf. e.g. W. Kellner & W. Kober, Arzneimittelforschung *4*, 310 (1954), *5*, 224 (1955), *6*, 768 (1956)). Various suggestions have also been made to employ the thymol contained in *Oleum Thymi* for the preservation of fresh goods, soya sauce and other foodstuffs, and as an antioxidant for bacon (see T. Bito, Bull. Nagoya Inst. Technol. (Anniversary Issue) *4*, 218 (1952), F. Fujikawa & A. Tokuoka, J. Pharm. Soc. Japan *71*, 129 (1951), H. Schmidt-Hebbel and G. R. Martini, Anales quim. farm. *1944*, 1—3). It is further known that certain organic carboxylic acids, in particular formic acid, acetic acid and benzoic acid, have a strong bacteriostatic or bactericidal effect, respectively, and therefore a preservative action. The lower aliphatic alcohols, e.g. ethanol in suitable concentration, have the same favourable properties.

It has now been found that effective compositions for the preservation of foodstuffs, for the sterilization of air in confined spaces and for cosmetic and pharmaceutical purposes, comprise:

(a) at least one essential oil having bacteriostatic and/or bactericidal properties and/or at least one bacteriostatically and/or bactericidally active compound extracted from such an essential oil,

(b) acetic acid or citric acid, and

(c) ethyl alcohol or isopropyl alcohol.

As examples of components (a) there may be mentioned: *Oleum Caryophylli* (oil of cloves), *Oleum Cynnamoni* (*cynnamon oil*), *Oleum Menthae* (peppermint oil), *Oleum rosmarini* (oil of rosemary), *Oleum Sinapis* (oil of mustard) and *Oleum Thymi* (oil of thyme). Substances may also advantageously be used which are present in essential oils, for example thymol and cinnamic aldehyde.

In addition to the components (a), (b) and (c), a solution promoter may also be incorporated in the compositions of the present invention in order to increase or bring about their solubility in water. Particularly suitable for this purpose are, for example, polyoxyethylene derivatives of fatty acids, and polyoxyethylene derivatives of fatty acid esters of anhydrosorbitols such as polyoxyethylene oleate or polyoxyethylene stearate and polyoxyethylene sorbitan monopalmitate, polyoxyethylene sorbitan mono-oleate, polyoxyethylene sorbitan mono-stearate, polyoxyethylene sorbitan tri-oleate and polyoxyethylene sorbitan tri-stearate.

It was also surprisingly found that with the use of solvents, the intensive smell of

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thymol and also of the carboxylic acid can be substantially toned lown.

In practice it is advantageous to use the new compositions containing a mixture of the active components in the form of an aqueous concentrate. Such concentrates have strong bacteriostatic and bactericidal properties and delay the development of mould fungi. If such concentrates are mixed with water in the volume ratio of 1:10 to 1:200, solutions are obtained which are admirably suitable as "ready-for-use solutions" for preserving foodstuffs in the broadest sense or for the sterilization and purification of air in confined spaces.

If such concentrates are to be used for preserving foodstuffs, it is advisable to add to the same, mucilages of vegetable, animal or synthetic origin. For economic reasons, vegetable mucous substances will preferably be used as mucilages, such as e.g. tragacanth, agar-agar or gum. If the goods to be treated are immersed in such ready-for-use solutions containing a mucous additive, it can be noticed after taking the goods out of the solution that the surface of the treated goods is provided more or less with a thin layer of this treatment solution, by means of which they are protected against deterioration.

To preserve or conserve foodstuffs, in particular meat and sausage goods, animal and synthetic intestines, fish and shellfish, one may proceed by diluting the compositions of the invention with water and applying this ready-for-use solution to the article to be protected, for example by steeping or immersion, or by spraying. Such a ready-for-use solution can however, if desired, also be mixed into the article to be protected during its production such as, for instance, may be the case in the production of sausage goods. For the sterilization of air in confined spaces a so-called ready-for-use solution can be sprayed or vaporized in the room in any desired manner, for example by means of a suitable apparatus, like the "Defensor" (Trade Mark) apparatus sold on the market, or a specially constructed rapid vaporizer.

The compositions of the invention may also be used in diluted or undiluted state for cosmetic and pharmaceutical purposes, e.g. for the prevention of body odour, for skin care, prophylaxis and therapy of colds and other illnesses, and for disinfection.

The preparation of some concentrates and some ready-for-use solutions, respectively, will be described hereinafter. The following Examples are intended merely to be illustrative of the invention and should not be interpreted as restricting same in any way.

EXAMPLE 1

15 g of thymol,
2 g of Oleum Cynnamomi Ceylanici and
1 g of Oleum Caryophylli

are dissolved in a mixture of 100 ml of glacial acetic acid, 25 ml of ethanol or isopropanol and 150 g of polyoxyethylene sorbitan monooleate.

The solution is brought to 1000 ml by the addition of fresh water, a clear concentrate thereby forming.

If 1 part by volume of this concentrate is diluted with 40 parts by volume of fresh water, a "read-for-use solution" is obtained which can be used for preserving fresh intestines such as sheep's guts and pigs' small intestines, by steeping these materials in this ready-for-use solution.

Tests have shown that intestines which were steeped for several months in the ready-for-use solution of this Example were ready for use at any time. In certain cases, an absolute sterility of such intestines could be noted.

EXAMPLE 2

18 g of thymol are dissolved in a mixture of 100 ml of glacial acetic acid, 25 ml of ethanol or isopropanol and 80 g of poly-oxy-ethylene oleate.

The solution is brought to 1000 ml by the addition of fresh water. A clear concentrate forms hereby.

If 1 part by volume of this concentrate is diluted with 70 parts by volume of fresh water, a ready-for-use solution is obtained. This solution is suitable for treating fresh intestines such as sheep's guts and pigs' small intestines, by steeping these intestine materials in the ready-for-use solution.

Tests have shown that intestines which were steeped for several months in the solution of this Example were ready for use at any time. In certain cases, an absolute sterility of such intestines could be noted.

EXAMPLE 3

3 g of Oleum Caryophylli,
3 g of Oleum Cynnamomi Ceylanici,
3 g Oleum Thymi and
0.5 g of Oleum Menthae

are dissolved in a mixture of 550 ml of ethanol and 100 ml of glacial acetic acid. The solution is brought to 1000 ml by the addition of fresh water. A clear concentrate forms hereby.

If 1 part by volume of this concentrate is diluted with 50 parts by volume of fresh water, a ready-for-use solution is obtained which can be sprayed in confined spaces by means of a suitable vaporizer and causes thereby sterilization of the air in the confined space.

If the glacial acetic acid in the above Examples 1 and 2 is replaced by citric acid, a multiple, preferably the triple amount of this acid will be used in order to obtain the same bactericidal effect.

The application of the compositions of the

invention is effected in practice preferably as follows:

1. Fresh intestines are briefly immersed in a ready-for-use solution, immediately taken out again and then steeped in a second ready-for-use solution having the same or a different composition. In this manner, the previously usual salting of intestines can be replaced.
2. Salted intestines are watered for a large amount of water, thereafter briefly immersed in a ready-for-use solution, immediately taken out again and then steeped in a second solution having the same or a different composition.

Care is to be taken hereby that the solution has a pH of 3—4 after immersion of the intestines.

It is further advantageous to turn the intestines steeped in a ready-for-use solution once or twice a week in the solution. Should the pH of the solution increase to about 5 during storage, it may be advantageous to remove the intestines from the said solution and to introduce the same into a fresh ready-for-use solution.

The application of the compositions of the invention for the sterilization of air in confined spaces for the purpose of storage and processing of foodstuffs, such as for example fresh meat and sausage goods, cheese and pastry goods, can be effected as follows:

The goods to be treated are stored or processed in conventional manner in a suitable room, the confined air in which has been pre-treated before commencing to fill the room for 2—4 hours by means of a suitable vaporizer with one of the above said ready-for-use solutions. In a confined space of 12—50 m^3 during a period of 24 hours 500—2500 cm^3 of the ready-for-use solution will advantageously be evaporated, whereby the deterioration of the goods stored in the said confined space is prevented.

WHAT WE CLAIM IS:—

1. A composition for the preservation of foodstuffs, for the sterilization of air in confined spaces, and for cosmetic and pharmaceutical purposes, comprising
   (a) at least one essential oil having bacteriostatic and/or bactericidal properties and/or at least one bacteriostatically and/or bactericidally active compound extracted from such an essential oil,
   (b) acetic acid or citric acid, and
   (c) ethyl alcohol or isopropyl alcohol.
2. A composition as claimed in claim 1, which also contains, as a solution promoter, a polyoxyethylene derivative of a fatty acid or a polyoxyethylene derivative of a fatty acid ester of an anhydrosorbitol.
3. A composition as claimed in claim 1 or 2, which also contains a mucilage of vegetable or animal origin or a synthetic mucilage.
4. A composition as claimed in claim 1, 2 or 3, characterized by consisting of an aqueous concentrate.
5. A composition as claimed in claim 1, which contains as the component (a) thymol and/or at least one of the following essential oils: oleum caryophilli (oil of cloves), oleum cynnamoni (cinnamon oil), oleum menthae (peppermint oil), oleum rosmarini (oil of rosemary), oleum sinapis (oil of mustard) and oleum thymi (oil of thyme).
6. A composition as claimed in claim 2, wherein the solution promoter is polyoxyethylene sorbitan mono-oleate or polyoxyethylene oleate.

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